

Ringwood Mines Landfill Site

Ringwood, New Jersey

Remedial Investigation and Remedial Action Selection Term Contract Number A-60243

Submitted to:



STATE OF NEW JERSEY
Department of
Environmental Protection
401 East State Street,
Trenton, New Jersey

Submitted by:



The Louis Berger Group, Inc.
30 Vreeland Road
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1.0 INTRODUCTION

The Louis Berger Group, Inc. (Berger) has been contracted by the New Jersey Department of Environmental Protection (NJDEP) to perform site-specific Remedial Investigations (RIs) and Remedial Action Selections (RAS) at multiple sites throughout the state (NJDEP Term Contract A-60243). Under this contract, the NJDEP has requested a remedial investigation of 47 residential properties at the Ringwood Mines Landfill site (Site). The purpose of the RI is to investigate each property for the presence of residual paint sludge and other related contamination.

This Generic Site Sampling and Investigation Plan (SSIP) presents a general proposed approach. Initially, a questionnaire will be distributed to the residents and/or property owners to obtain property-specific information. Upon access authorization, a Site walk will be conducted with the owner of each property to document conditions prior to investigation and to obtain property owner input on types and extents of sampling/investigation schemes. Based on the information obtained from the questionnaire and the Site walk, a Property-Specific Work Plan (PSWP) will be prepared for each of the 47 residential properties for review and approval by NJDEP and the property owners. The RI activities outlined in the PSWPs will then be conducted at each property at which the owner grants access and approval.

All sampling and investigation activities described in the Generic SSIP will be performed in accordance with N.J.A.C. 7:26E; the New Jersey Technical Requirements for Site Remediation (NJDEP, 2003), the New Jersey Field Sampling Procedures Manual (NJDEP, 2005), and in accordance with procedures detailed in Berger's Programmatic Health and Safety Plan (HASP) and Site Specific Health and Safety Plan (SSHASP).

The following subsections present a brief overview of the Site and previous investigation and remediation conducted. Most of this information is extracted from documents prepared by ARCADIS G&M, Inc., the consultant for the Ford Motor Company (Ford).

1.1 Site Description and History

The Site is located in the northeastern corner of Passaic County within the southeastern extension of the highlands of the New England Physiographic Province (Figure 1). The Highlands consist of crystalline bedrock forming prominent ridges. Valleys are typically

filled with unconsolidated glacial deposits that overlay the bedrock. The Site consists of rugged forest areas, open areas overgrown with brush, abandoned mine workings, sealed mine pits, an inactive municipal landfill, an industrial refuse area, small surficial dumping areas, a municipal recycling center, the Ringwood Borough garage, and the 47 private residences located north of Margaret King Avenue in Ringwood (Figures 2 & 3).

Magnetite mines were operated on Site as early as the 1700s. Commercial mining operations continued until at least the 1930s. From approximately 1967-1971, a contractor for Ford Motor Company named O'Connor Trucking and Haulage Corporation (O'Connor) operated a landfilling operation at the Site. During this period, O'Connor disposed of at the Site a variety of refuse generated by the Ford production plant in nearby Mahwah, NJ. This refuse included cardboard, general trash, paint sludge and scrap drums. The Ringwood Solid Waste Management Authority operated a municipal landfill in the vicinity of the Borough Garage from 1972 until the State of New Jersey ordered it closed in 1976. There are also indications that unsupervised dumping of waste by other parties occurred at the Site.

1.2 Previous Investigation/Remediation

The Ringwood Mines Landfill Site was added to the EPA National Priorities List (NPL) on September 1, 1983. Remedial Investigation (RI) activities were conducted between 1984 and 1988, and a Risk Assessment (RA) and Feasibility Study (FS) were completed in 1988. The FS recommended implementation of a long-term Environmental Monitoring Program (EMP), which was embodied in a Record of Decision (ROD) issued by EPA in 1988. Removal actions occurred in 1987 and 1988, prior to the completion of the RA and ROD, and subsequent removal actions took place in 1990, 1991, 19995 and 1997-98.

Based on the results of the RI/FS, RA, EMP, and supplemental investigation, EPA deleted the Site from the NPL on November 2, 1994. Subsequent to deletion from the NPL, EPA required, and Ford performed, a number of additional removal actions. In 2002, EPA determined that monitoring was no longer required. In response to concerns raised by the community regarding the adequacy of the initial cleanup, EPA has requested that Ford conduct additional investigation/remediation of any remaining areas of Ford-generated waste.

In April 2004, Site residents showed the EPA paint sludge remaining at the Site. Between May 2004 and October 2005, EPA worked with the Site residents and their attorneys in an attempt to obtain access to residential properties to investigate the presence of paint sludge or other industrial waste, and to remove paint sludge during these investigations. EPA was unable to obtain a satisfactory access agreement from Site residents.

At the request of the EPA, the NJDEP accepted responsibility for performance of the residential property investigation in October 2005. During the first week of November 2005, the NJDEP Bureau of Emergency Response excavated chunks of visible paint sludge located on, or immediately adjacent to, three Site residences. In January 2006, the NJDEP contracted Berger to conduct remedial investigation of 47 residential properties at the Site.

2.0 INVESTIGATION ACTIVITIES

The following subsections provide rationale and descriptions of the 2 phased approach to investigative activities that are planned for the remedial investigations to address the potential soil contamination at the 47 private residences at the Site. It is anticipated that this first phase of the investigation will consist of: historic aerial photo and topography reviews, a homeowner survey, a site walk, and development of a property specific workplan (PSWP) for each property. The second phase of the investigation will implement the PSWPs which will consist of a geophysical/utility investigation, soil investigations and, if necessary, a groundwater investigation. Following completion of all investigative activities a results report will be submitted to the NJDEP.

2.1 Phase I Investigations

The first phase of the investigation activities for the Site is designed to be non-intrusive and will consist of a review of historic and current data available, a survey/questionnaire of the property owner and/or current primary resident, a site walk of each property, and the development of a PSWP which will outline the second phase of the investigative activities proposed for each of the Site properties. The following subsections outline the activities associated with these Phase I investigations.

2.1.1 Historic Aerial Photo and Topography Review

Site maps will be created using the existing site survey data along with historical aerial photographs. The review of these topographic maps and aerial photos will aid in determining historic and recent changes in topography for the investigation area. Currently there is topographic data available from 1961, 1974, and 2003. Historic aerial photography is available for 1940, 1951, 1961, 1969 and 1974. The topographic maps and aerial photographs will demonstrate the changes in surface elevations of the investigation area from 1961 to 2003. These changes of elevation may indicate areas that have been subject to historic land filling and/or earth removal. Figure 4 shows the changes in elevation from 1961 to 1974 for the entire Site, and Figure 5 shows the changes in elevation from 1974 to 2003.

2.1.2 Homeowner Survey/Questionnaire

Following review of historic photos and topographic data, door-to-door personal surveys of individual property residents and/or owners will be performed by members of the Berger/NJDEP project team. The project team members will ask each homeowner and/or resident questions regarding their historical and physical knowledge of their property, including items such as: locations of water lines and septic tanks or leach fields; observations of sink holes or depressions; past or present observations of paint sludge at the surface or subsurface on their property; or recollection of past filling or dumping events.

2.1.3 Site Walk

For each property, a site walk with the homeowner will be necessary to development of the individual PSWP for that property. During the property site walk, the project team will utilize the topographic maps, aerial photos, and the homeowner/resident's personal insights and knowledge to aid in targeting areas of each property that may have been previously filled, and which may contain potentially contaminated sludge and/or soil. Existing conditions of the property will be video taped and photographed at the time of the initial site walk. During the property site walk, members of the Berger/NJDEP project team and the homeowner will also discuss and review the various types and extent of potential sampling and investigation activities that may be employed in the second phase of the investigation. In all cases, the homeowners and residents expressed insight, input and concerns will be taken into consideration and incorporated into development of the Property-Specific Workplan (PSWP).

2.1.4 Development of Property-Specific Workplan

Following the site walk and compilation and evaluation of the data, the project team will create a PSWP for each property which will include a property-specific site plan showing where field activities will be proposed. The individual workplans will take into consideration the findings from the first phase of the investigations including the elevation changes in topographic maps and historic aerial photos, the completed homeowner's questionnaires, as well as insight from the discussions and observations made during the site walks. The workplan will outline the proposed detailed investigation activities for each property, which may include soil sampling, test pit excavation and groundwater sampling.

2.2 Phase II Investigations

The second phase of investigation activities will consist of a geophysical survey to locate utilities, soil investigations to identify and sample sludge and contaminated soil, and if deemed necessary by NJDEP based on the results of initial soil investigations and field observations, a groundwater investigation consisting of monitoring well installations at targeted properties may be included. See Attachment 2 for examples of the various subsurface investigation technologies that may be used to implement the Phase II investigative activities.

To ensure the health and safety of the community, property residents and investigation workers during intrusive subsurface investigative activities planned for Phase II such as test pit excavation, soil boring and monitoring well installation, all work will be performed in accordance with procedures detailed in Berger's Programmatic Health and Safety Plan (HASP) and Site Specific Health and Safety Plan (SSHASP). Specifically, the HASP and SSHASP will include procedures to monitor and address potential health and safety issues associated with intrusive field work including, but not limited to: establishment of exclusion zones in the vicinity of excavation and/or drilling activities, field screening of excavated or drilled soil, and ambient air monitoring during intrusive subsurface operations.

2.2.1 Geophysical Investigations

In some instances where determined warranted, geophysical surveys may be conducted in an attempt to confirm the presence and location of subsurface structures and utilities such as USTs, septic tanks and leach fields, and water lines prior to invasive subsurface activities such as excavation and/or drilling. Subsurface utilities can act as prohibitive obstacles to investigation and, therefore, must be identified and marked in the field to enable adjustments to planned subsurface work, if necessary.

The geophysical survey method typically used to identify subsurface structures and utility piping is a combined Ground Penetrating Radar (GPR) / Pipe Location Survey. This type of geophysical survey will be conducted at each property, where deemed needed, to locate and orient water supply lines, septic system and UST location, as well as any other subsurface utilities that may be present.

2.2.2 Soil Investigations

Included within each PSWP will be the proposed soil investigation activities for that property displayed on a property-specific plan. Although several subsurface exploration methods are available, including direct push and hollow stem auger drilling technologies, due to the rocky nature of the lithology and the shallow depth to bedrock, the project team has determined that excavation of exploratory test pits with a small backhoe will serve as the most effective means for subsurface investigations and will, in most cases, be used as the primary investigation method. In some cases, however, particular site conditions may be more conducive to soil sampling and characterization via soil borings using direct push, auger drilling and/or hand auger methods; instances in which these technologies are applicable and warranted will be evaluated and determined on a site-specific basis.

Based on the results of the initial Phase I investigation activities and following utility markouts and geophysical surveys of the areas, test pit excavations and/or soil borings will be used to determine the presence and extent of suspected sludge or other fill material, and to collect soil samples for laboratory analysis. It is proposed that, at a minimum, several test pits be excavated throughout each property. At targeted areas where historic filling is suspected, additional test pits at more frequent intervals will be proposed. An example of a typical PSWP test pit location map is presented as Figure 6.

In general each excavation will measure approximately 2 ft wide x 5 feet long x 5 feet deep, although actual test pit dimensions will be dependant upon several factors, including: physical access limitations for each location, utility clearance, depth of encountered fill material, depth of water table, and depth to bedrock.

Excavated soil will be visually inspected specifically for evidence of paint sludge, other fill material and, in general for otherwise contaminated soil. All soil will be field screened for organic vapors using a photo-ionization detector (PID) and will be classified by a geologist using the Burmister soil classification system.

All excavated soil will be temporarily stockpiled adjacent to the test pits. Following soil characterization and sampling, the excavated material will then be used to backfill the excavations in the reverse order from which it was removed (the soil last removed backfilled first, and soil first removed backfilled last).

Typically, up to three soil samples will be collected for laboratory analysis from each test pit. Individual soil sampling depths and locations will be determined based on field screening and visual/olfactory observations. A basic example of the sampling scheme is presented below:

Typical Sample Scheme

Sample ID	Sample Interval	Sampling Description/Intent
TP01A	0 - 2.0 ft	Surface soil (0-0.5' for SVOC, PPCB, Mets; 1.5-2.0' for VOC).
TP01B	3.0 - 3.5 ft	Fill material, depth biased to field screening readings.
TP01C	5.0 - 5.5 ft	Natural soils below fill material.

Soil samples will be analyzed by a New Jersey certified laboratory for the full USEPA Target Compound List (TCL+30) and Target Analyte List (TAL) metals including, cyanide. Laboratory analysis of TCL+30 includes volatile organic compound (VOC), semi-volatile organic compounds (SVOC), and polycyclic biphenyls (PCB). All soil sample locations will be recorded in the field using GPS data logging equipment.

2.2.3 Groundwater Investigations

Upon completion of the soil investigation, and at the discretion of the NJDEP, a limited groundwater investigation may be conducted at targeted properties as warranted.

As with the soil investigation, there are several groundwater characterization methods available, including temporary well installations or permanent well installations. Temporary well installations generally result in the collection of turbid groundwater samples which typically exhibit elevated concentrations of metals, not the actual metals concentrations present. Since lead is a primary contaminant of concern for the site, the use of temporary wells, therefore, is not recommended.

If a groundwater investigation is warranted at a particular property, it is recommended that a permanent monitoring well(s) be installed using hollow stem auger or air rotary drilling techniques. Permanent wells, if needed, will be constructed so that the screened interval is bridging the first water table encountered. Upon completion, each monitoring well will be surveyed by a licensed surveyor for horizontal and vertical location.

Following a minimum of two weeks after permanent well development, a round of groundwater elevations will be recorded and each monitoring well will be sampled using low flow purging and sampling technology. The groundwater samples collected will be analyzed for TCL+30 and TAL metals.

2.2.4 Supplemental Investigations

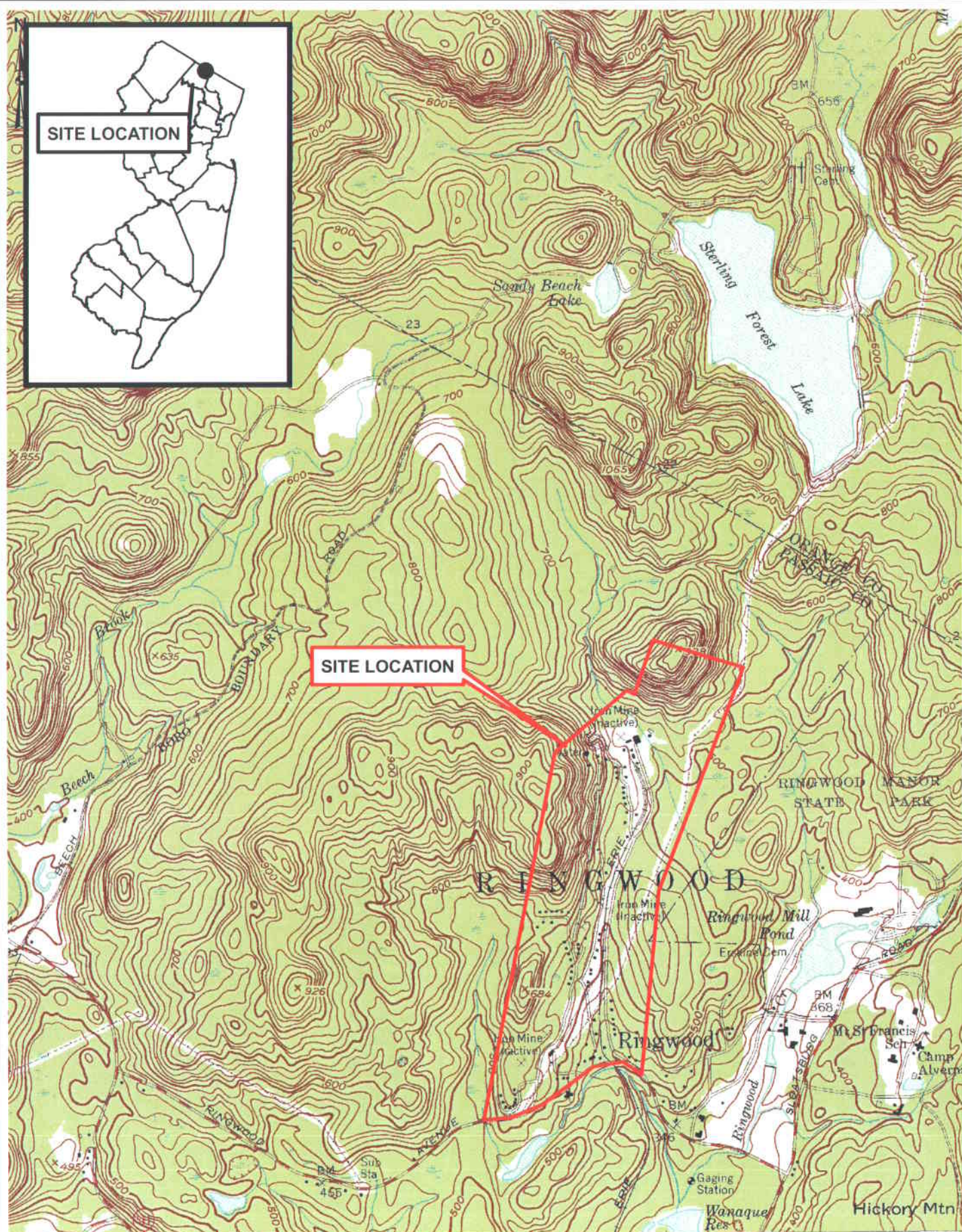
In addition to soil and groundwater sampling and analysis, supplemental investigation of other media and areas of concern will be considered on a site-specific basis. The results of the initial soil and groundwater investigations will be evaluated to identify the need for these supplemental investigations.

2.2.5 Results Report

Following the implementation and completion of all activities proposed within each of the PSWPs, a single comprehensive results report will be submitted to the NJDEP. Within the comprehensive results report, the individual investigation results for each property will be addressed in separate chapters. The comprehensive results report will be prepared to include the following elements:

- a description of all investigative activities performed;
- compilation and analysis of all derived investigative data;
- conclusions drawn from the data analysis;
- recommendations for any further remedial investigations or remedial actions, if warranted.

FIGURES



N.J. Department
of Environmental
Protection

RINGWOOD MINES LANDFILL SITE, RINGWOOD, NEW JERSEY

SITE LOCATION MAP

NJDEP CONTRACT No. A-60243

The Louis Berger Group, Inc.

30 Vreeland Road
Florham Park, NJ

FIGURE 1



REF: BASED ON ARCADIS FIGURE, 2005

FILE: PATHNAME10JUN05



N.J. Department
of Environmental
Protection

RINGWOOD MINES LANDFILL SITE, RINGWOOD, NEW JERSEY

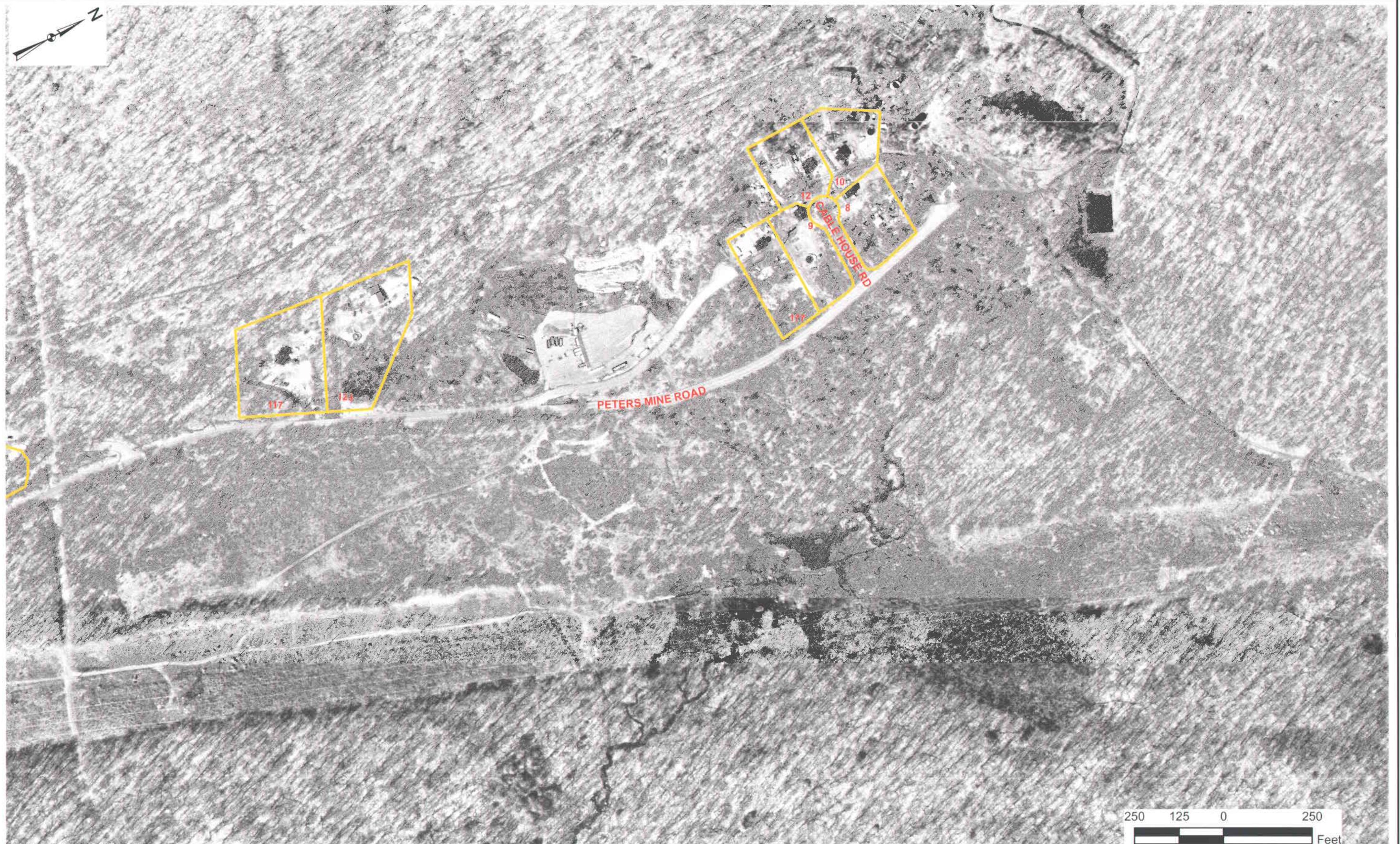
SITE PLAN - SHEET 1

NJDEP CONTRACT No. A-60243

The Louis Berger Group, Inc.
30 Vreeland Road
Florham Park, NJ

FIGURE 2

FILE PATH\NAME\10JUN05



REF: BASED ON ARCADIS FIGURE, 2005



N.J. Department
of Environmental
Protection

RINGWOOD MINES LANDFILL SITE, RINGWOOD, NEW JERSEY

SITE PLAN - SHEET 2

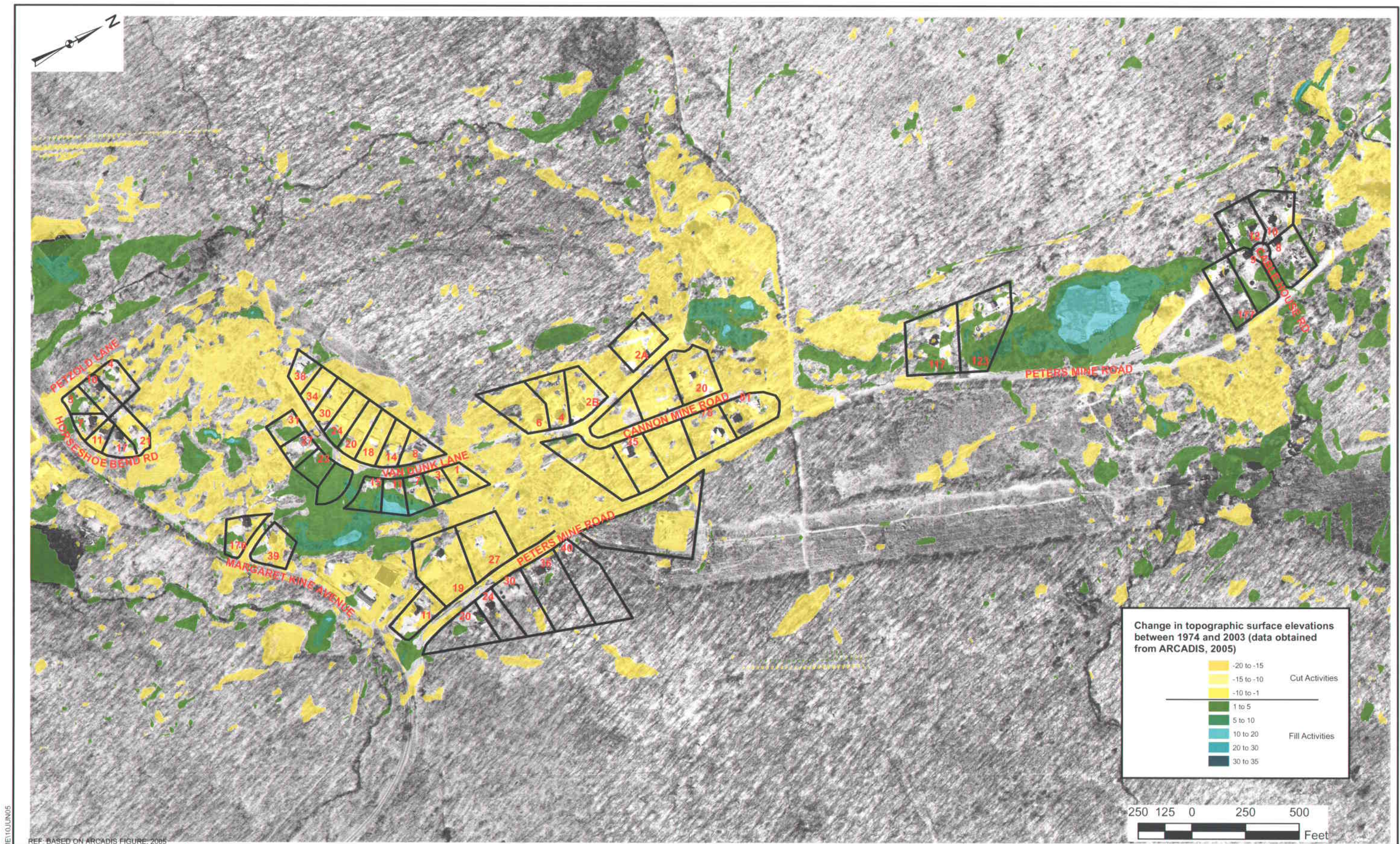
NJDEP CONTRACT No. A-60243

The Louis Berger Group, Inc.



30 Vreeland Road
Florham Park, NJ

FIGURE 3



FILE: PATH8\NAME\10JUN05

REF: BASED ON ARCADIS FIGURE, 2005

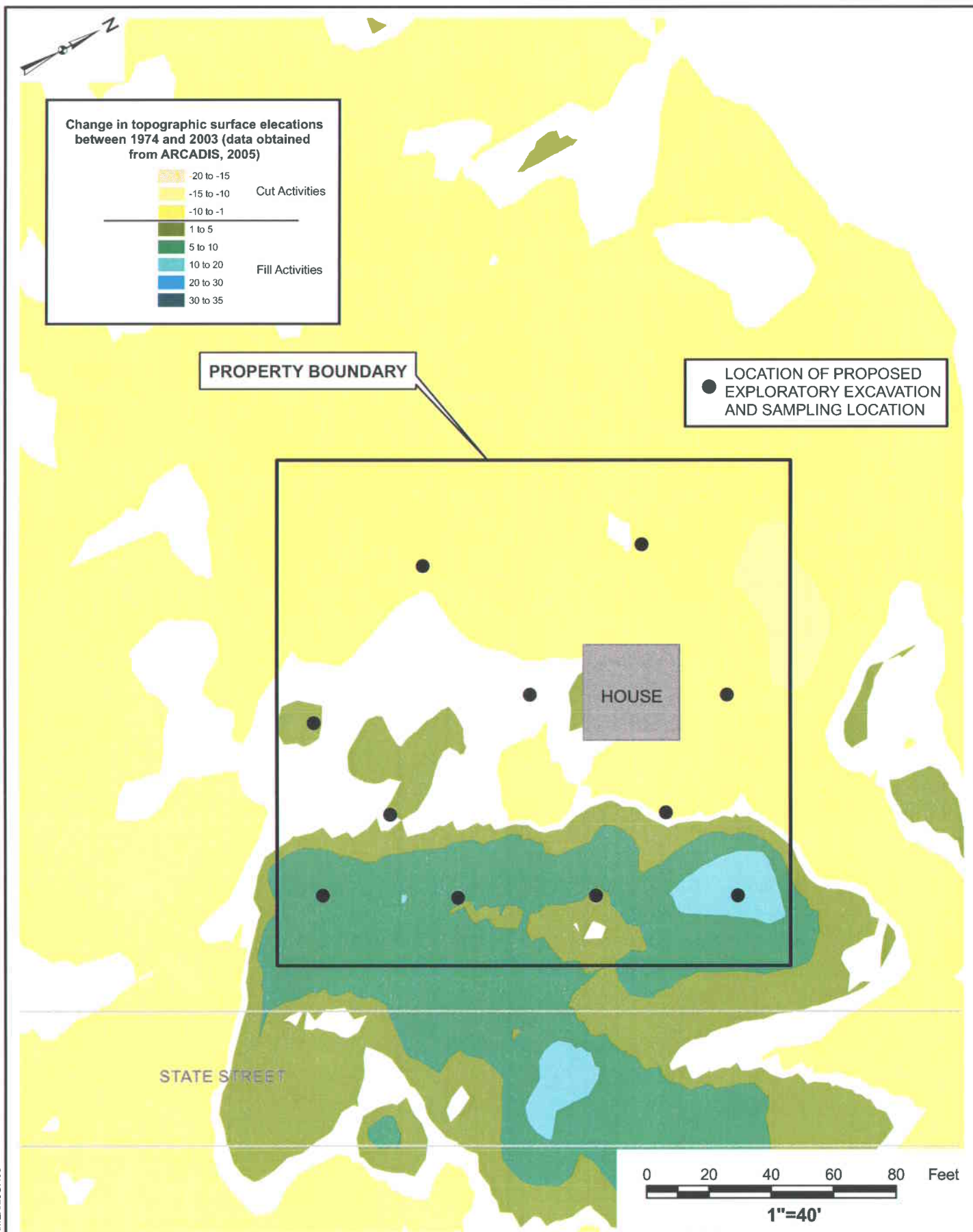


RINGWOOD MINES LANDFILL SITE, RINGWOOD, NEW JERSEY
TOPOGRAPHIC SURFACE CHANGE - 1974 TO 2003
 NJDEP CONTRACT No. A-60243

The Louis Berger Group, Inc.
 30 Vreeland Road
 Florham Park, NJ

FIGURE 5

FILE_PATH\NAME\02JUN05



N.J. Department
of Environmental
Protection

RINGWOOD MINES LANDFILL SITE, RINGWOOD, NEW JERSEY
PROPERTY SPECIFIC INVESTIGATION PLAN
NJDEP CONTRACT No. A-60243

The Louis Berger Group, Inc.
30 Veeland Road
Florham Park, NJ

FIGURE 6

ATTACHEMENT – 1
Resident/Homeowner Questionnaire



State of New Jersey

Department of Environmental Protection

Jon S. Corzine
Governor

Lisa Jackson
Commissioner

Ringwood Mines Landfill Site Remedial Investigation of Residential Properties Resident/Homeowner Questionnaire

DIRECTIONS:

Please complete this form by writing the answer in the space provided next to the question, or by circling the most appropriate response.

PROPERTY ADDRESS

LOT#

BLOCK #

1 Primary Resident Name

Years lived at this property

2 Property Owner Name

Property Owner Address

Years Property Owned

Years lived at this property

Year House Built

3 Have you ever seen paint sludge or other types of fill/debris on or near this property? YES NO

If yes, where?

4 Have you witnessed the disposal of paint sludge or fill/debris on or near this property? YES NO

If yes, where?

5 Are you familiar with how the current house on this property was constructed? YES NO

If yes, can you provide construction details, such as basement, slab or crawl space information?

6 Can you indicate where the main water line to the house runs? YES NO

If yes, where?

7 Can you indicate where the septic tank and/or leach field are? YES NO

If yes, where?

8 Can you provide any other information that you think would help in the planned remedial investigation of this property? YES NO

If yes, please explain.

9 Other comments: _____

Resident's Signature _____ Date _____

Property Owner's Signature _____ Date _____

Interviewer Name _____ Company _____

Interviewer Signature _____ Interview Date _____

ATTACHEMENT – 2
Subsurface Investigation Technologies

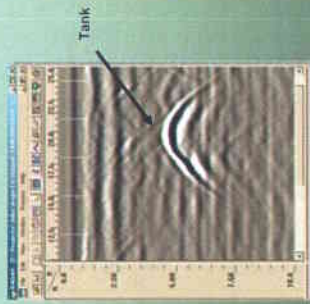
Geophysical/Utility Locating



Using GPR to Locate an Underground Storage Tank (UST)



Pipe Locating Using Radio Detection Meter (RD)



Real Time GPR Data Shows The Exact Depth and Location of the UST.

Direct Push and Hollow Stem Auger Drilling



Track Mounted Direct Push Drill Rig



Pickup Truck equipped with Direct Push Drilling Capabilities



Tracked Vehicle Capable of Direct Push and Hollow Stem Auger Drilling

Exploratory Excavations



Test Pits Being Excavated Using a Small Backhoe Capable of Work at Sites With Limited Access



Drill Rig for Installation of Monitoring Wells



Conventional Drilling Technology Used to Install Monitoring Wells



N.J. Department
of Environmental
Protection

SUBSURFACE INVESTIGATION TECHNOLOGIES

Ringwood Mines Landfill – Ringwood, NJ

The Louis Berger Group, Inc.



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March 2006